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Lord Rosse (*Observations of Nebulæ and Clusters of Stars*, p. 63) records the results of nine observations made between the years 1849 and 1856, when he saw a spiral appearance by the brightest star, some unresolved milkiness about the central star, very curious black spaces, smaller stars so confused together as to give a nebulous look to parts of the cluster.

The photograph shows the cluster as a remarkable aggregation of faint stars in the midst of crowded surroundings of similar stars which cover the sky over several degrees. On the negative the cluster seems like an island in a sea, and the black spaces in it, referred to by Lord Rosse, are very conspicuous, and resemble those in the globular cluster Messier 13 *Herculis*. There are also branched lines and curves of stars very similar to those seen in globular clusters, but there is no indication whatever of nebulosity in this, as I always have found to be the case in globular clusters.

It puts little stress on the imagination to perceive in this cluster the progressive development of a globular cluster from a nebula or from meteorites, all the nebulosity being condensed into stars. Or we might take the converse of this, and assume that the stars are gravitating to a centre when they will collide and evolve nebulosity; but the first suggestion appears to me the more probable.

There are other examples of apparent similar developments; such, for instance, are the clusters ♅ VI. 33, 34 *Persei* and Messier 11 *Antinoi*, which indicate the forms of globular clusters, but without the nebulosity. These inferences will be better appreciated if I now show by the lantern the original negatives of this cluster and of ♅ VI. 33, 34 *Persei*, Messier 11 *Antinoi*, and M. 13 *Herculis*.

It will be seen that the resemblance which these clusters bear to the globular cluster is very striking, and impresses upon us the probability that such clusters as these and globular clusters have some close relationship in their origin like that herein suggested.

Photograph of the Nebulæ ♅ V. 42 *and* ♅ I. 176, 177 *Comæ Berenicis.* By Isaac Roberts, D.Sc., F.R.S.

The photograph of the nebulæ ♅ V. 42 and ♅ I. 176, 177 *Comæ Berenicis*, R.A. 12^{h} 38^{m}, Decl. 33° 0′ north, was taken with the 20-inch reflector on 1894 March 29, with exposure of the plate during three hours, and the copy now presented is enlarged to the scale of 1 millimetre to 24 seconds of arc.

The Nebula ♅ V. 42

is No. 4,631 in the *New General Catalogue*, and No. 3,165 in the *General Catalogue*, where Sir J. Herschel describes it as a

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remarkable object, very bright, very large, exceedingly extended 70°±, brighter in the middle with a nucleus, and a bright star near. In the *Phil. Trans.* 1833 he gives a drawing of it (Pl. XV. fig. 76) which shows the nebula extended to a fine point at each end, and it has a dense nebulous centre but no stars involved; a faint nebula (H̥ II. 659) is visible near it on the *north preceding* side.

Lord Rosse (*Observations of Nebulæ and Clusters of Stars*, p. 119) describes it as a most extraordinary object with a bright star near the centre, and to the right (*n*) masses of light appear through it in knots. A drawing of it is given in the *Phil. Trans.* 1850, Pl. XXXVII. fig. 9, which has several features resembling the photograph, but no stars are shown to be involved in it.

The photograph shows the nebula much resembling a mackerel in form and markings, the head being on the *following* and the tail at the *preceding* end. The margins are rugged, as shown on Lord Rosse's drawing, but the interior is a mixture of nebulous condensations and stars with fairly well-defined margins, seventeen of which I counted involved in the nebula, besides several condensations of nebulous matter. There is no certain central nucleus, though there is a bright star near the centre, touching the northern edge. The nebula seems to be a circle or an oval seen nearly edgewise, but with the southern edge a little elevated. The nebula H̥ II. 659 is shown on the north side near it, with a stellar nucleus surrounded with nebulosity, and the bright star referred to by both Sir J. Herschel and Lord Rosse is also visible. The position angle of the nebula is given by Sir J. Herschel as about 70°, but the photograph shows it to be nearly on a parallel of declination.

The Nebulæ H̥ I. 176, 177

are shown on the same photograph as H̥ V. 42, and are numbered respectively 3,189 and 3,190 in the *General Catalogue.* The first (176) is described by Sir J. Herschel as a remarkable object, pretty bright, large, very much extended in the direction 34°·3, and is *south preceding* of two. The second (177) is described as a remarkable object, pretty faint, large, extended in the direction 90°± *north following* of two. In the *Phil. Trans.* for 1833, Pl. XV. fig. 75, a drawing is given which shows two patches of faint nebulosity crossing each other at their ends at an obtuse angle, but no structure or condensation of nebulosity is indicated in either of them.

Lord Rosse (*Observations of Nebulæ and Clusters of Stars*, p. 120) states as the result of eleven observations that Herschel's two nebulæ form one, the joining part in the middle faint, and with faint prolongation of the nebula on the *south preceding* side. "Is like a caterpillar on a leaf," glimpses of bands seen, end turns up at an angle of 60°, suspected a continuation of shorter end curving back, *south preceding* nucleus very well defined.

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The drawing given in the *Phil. Trans.* 1861, Pl. XXVIII. fig. 26, conveys a good idea of the form of the northern half of the nebula.

The photograph clearly confirms Lord Rosse that it is one, and not two nebulæ, and the four stars shown in his drawing are in the positions he indicates; two of them are very faint, and it is remarkable that he did not see the three other stars involved, which the photograph shows to be much brighter than the two he refers to. There is a bright star in the centre of the figure, with dense nebulosity on the *south following* side of it, and five fairly well defined stars are involved in the dense nebulosity of the bright *north following* half of the nebula, the end of which is, like a hook, turned towards the *south following* side. The *south preceding* half of the nebula is much fainter, and spreads out wider, than the other half, and there are some nebulous structures and three very faint star-like condensations in it. The nebula seems as if it were assuming a spiral form, and that there had been a collision on the *north following* half, with the effect of closing together the nebulous mass and forcing part of it in the *south following* direction.

Photograph of the Nebulæ M 65, 66 *and* H V. 8 *Leonis.*

By Isaac Roberts, D.Sc., F.R.S.

The photograph of the nebulæ M 65, 66 and H V. 8 *Leonis*, R.A. 11^{h} 14^{m}, Decl. 13° 50′ north, was taken with the 20-inch reflector on 1894 February 28, with exposure of the plate during three hours forty minutes, and the copy now presented is enlarged to the scale of 1 millimetre to 24 seconds of arc.

The Nebula M 65, *New General Catalogue*, 3,623, *General Catalogue*, 2,373,

is described by Sir J. Herschel as bright, very large, much extended in the direction 165°±, gradually brighter in the middle, with a nucleus; eight observations were made. In the *Phil. Trans.* for 1833, Pl. XIV. fig. 53, he gives a drawing, but it does not compare well with the photograph.

Lord Rosse (*Phil. Trans.* 1850, Pl. XXXVII. fig. 7) gives a drawing of the nebula, and on p. 512 states that it is resolvable, a spiral or an annular arrangement about it, no other portion resolved; and in the *Observations of Nebulæ and Clusters of Stars*, p. 95, he gives the results of eight observations made between the years 1849 and 1861, and states that he suspected seeing, at times, dark spaces on either side of the nucleus, and some mottling and stars sparkling in it. He also saw a star close *following* the nucleus, but did not see the curious ring which, he says, Sir J. Herschel saw.